

# ON THE STRUCTURAL-PHENOMENOLOGICAL THEORIES OF CONSCIOUSNESS

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## 1. INTRODUCTION

The problem of consciousness witnessed a serious reconsideration in the last years [1] [2] [3]. The models of consciousness presented so far depend on the ontological frame of thinking of various authors. The recent theories and models of mind can be divided in two main categories:

- structural theories: Crick and Koch [4]; G. Edelmann [5]; Roger Penrose [6]; Daniel C. Dennett [7] a.o.
- structural-phenomenological theories: M. Drăgănescu [8]; David Chalmers [9].

There is also another point of view based on the consideration that consciousness cannot be explained at all. This may be considered a mysterian position and those who advocate it are named mysterians [10].

## 2. THE STRUCTURAL THEORIES ARE INSUFFICIENT

Both David Chalmers and I consider that the structural science cannot elucidate mind and human consciousness, therefore cannot explain the totality of reality. I consider that even life cannot be explained by the structural science. Concerning the structural science, both of us are speaking about today science that is based on the physics of particles, fields and waves, and on all determined systems by these.

Based on the orthophysical (structural-phenomenological ) philosophy of science [8], I have shown recently [11] [12] that the neo-structural science based on complexity (in fact, structural complexity), neural (biologic and electronic) networks, fractals, interconnectivities, cellular automata, deterministic chaos, artificial life, etc. cannot explain life, mind consciousness and, finally, the nature of matter and existence.

Much more, I elaborated a general *principle of the insufficiency of structural knowledge* [13]. Science can be done in the realm of the structural knowledge with very good results in this sphere; the structural domain of knowledge cannot

completely, and in fact not at all, explain the living objects with their mental processes. The principle of the insufficiency of structural knowledge is not saying that science cannot know life, mind and consciousness; on the contrary, it implies that science has to be extended beyond the structural domain, but including it.

David Chalmers has shown that neuroscience (structural neuroscience) is not enough to explain consciousness and, in general, considers that,

"The trouble is that physical theories are best suited to explaining why systems have a certain physical structure and how they perform various functions. [...] But consciousness is a different sort of problem entirely, as it goes beyond the explanation of structure and function" [14].

For him,

"Almost everything in the world can be explained in physical terms  
.....[but]....consciousness escapes the net of reductive explanation" [15],

and,

"But from structure and dynamics, we can get only more structure and dynamics" [16].

For Chalmers, physics = structural physics, and there is no other larger physics (as we suppose orthophysics to be). He considers physics (structural) as a closed domain of knowledge.

I agree completely with the denouncement by D.Chalmers of the structural physics and science, and with the idea of finding a way toward a structural-phenomenological science. This is an essential step for both of us.

From now on, it is essential that any phrase has to be understood under a structural or a structural-phenomenological frame of thinking. When we say "knowledge of the brain does not yield complete knowledge of conscious experience", under a structural frame (S-frame) this means "structural knowledge of the brain cannot completely explain conscious experience". This is correct. Under a structural-phenomenological frame (SP-frame) the first proposition is no more valid, because knowledge of the brain may explain conscious experience. The brain, as entity, contains both structural and phenomenological parts, and is a substratum for the mind.

It is curious that most of the propositions of psychology are valid both in S-frame and SP-frame. Of course, a part of the propositions is valid only in an S-frame. Most of today psychological knowledge remains valid in an SP-frame and perhaps better

suiting to this frame. Psychology is today a science with an unspoken structural-phenomenological background.

In a recent public exposition [17], considering that there is not really a crisis in science, but only a state of impasse concerning the explanation of life, mind and consciousness, I showed that the impasse of the structural science is absolute. There is no possibility to overcome the present deadlock of the science by the structural science.

In such a case it is necessary, indeed, to overcome the structural science in a phenomenological direction.

### III. A COMPARISON OF STRUCTURAL- PHENOMENOLOGICAL THEORIES

As mentioned in the previous paragraphs, there are two proposed structural-phenomenological theories of mind and consciousness that have important common points, even if not in details, but have also perhaps essential differences.

Chalmer's proposed theory takes the consciousness, or the *experience*, to be a fundamental process of nature, quite different from all what we have known in physics. For him, the nature of experience is not at all physical. He accepts a "natural dualism" concerning the entire reality.

For the orthophysical version, *experience* is, or is very near, a *phenomenological sense*, considered a fundamental process of nature quite different from all the known structural physical processes.

If the phenomenological sense is a fundamental phenomenon, then it may be present in all the fibers of reality. It may manifest itself in many circumstances not only in the human and animal consciousness. Why not for any living object? I supposed that this is for the case for any living object, and the discrimination between the living consciousness and any other organism concerning the manifestation of phenomenological senses cannot be accepted. Then, also *experience* may be present in any living object (organism). The **content** of experience is or has something of a phenomenological sense. Both *experience* and phenomenological sense, even if they are recognized only in the case of consciousness, are real phenomena. I consider the phenomenological sense to be fundamental, and being fundamental, it is a general property of nature. Also at this deeper level, the nature has something complementary

in itself, unknown yet. In a strong sense the existence is not dual, it has a fundamental complementarity, and complementarity may be a general ontological law [18] [19].

It is true that the last (or the first, depending on the way the things are seen) complementarity of existence may be nevertheless regarded as an "attenuated dualism"; some sort of natural dualism is functioning at a deeper level of reality and manifests itself also at higher levels. Thus, the "natural dualism" and "complementarity" are not so far apart, but we prefer the term "complementarity" and its profound meaning because it maintains the idea of a unitary, although complementary world.

Using the structural knowledge and its general situation of absolute impasse, as described above, and using the *experiment* of introspection, in its experiential form, it is, we think, obligatory to *recognize* the existence of a special mental sense, which in its generality as a general phenomenon, is a phenomenological sense [17]. The structural-phenomenological recognition, as a part of the scientific method [20], may lead as direct as possible to the recognition of the phenomenological sense in consciousness phenomena. The result of this recognition must satisfy a "theoretical criterion of falsificability"[21]. If it is impossible to find a structural theory, y compris an experimental proof in the S-frame, that can explain consciousness phenomena, then the result of the structural-phenomenological recognition is representing a truth. In the structural-phenomenological recognition there is an experimental part ( the introspection), but in order to recognize the phenomenological sense, initially recognized as a mental property, as a general and extended phenomenon in the deep underlying reality, in all organisms, and even in all matter, there are some other steps to be done [8a] [8b] [17]. And still remains to be found at least one more experimental proof in order to clarify the general ontological status of the phenomenological sense. Such an experiment is not yet proposed or recognized in science. The speculative construct that follows the recognition of the mental phenomenological sense may try only to give a possible explanation of the behavior of the entire existence with which we are confronted.

Concerning the recognition of the mental phenomenological sense, no structural theory is capable to infringe the theoretical criteria of falsificability, as Chalmers, in his way, and myself has shown. After recognizing this phenomenological ( experiential) sense, what follows in both SP-theories is, *more or less* , a speculative theory.

The ways taken by the two SP-theories may be different, but an interesting common point is the importance of the notion of information for these theories.

David Chalmers, in a first approach, uses the notion of information in a Shannonian style, both for the structural information and for the experiential senses. In a second approach, he thinks about the content of the phenomenological information.

He is asking if,

"Is information primary, or is it really the physical and the phenomenal that are primary, with information merely providing a useful link?" [21].

Information, in a space of items, represents the selection of one of the items. The space of items may be structural, that is a structural information space with structural items, or may be phenomenological, or even structural-phenomenological. The selection of a P-item in a P-space, or of an SP-item in a SP-space represents an information. For Chalmers, there are information states (the above items) within these spaces, and there is a coherence between the "physical" and "phenomenal" information spaces:

"...whenever we find an information space realized phenomenally, we find the same information space realized physically. And when an experience realizes an information space, the same information state is realized in the experience's physical substrate"[23].

The information state, in a shannonian view, is the same in both spaces related to consciousness. This view of information, without semantics, is only a shannonian informational characterization, and information is not a primary or fundamental notion:

"...information is simply a useful tool in characterizing this common structure; it does not correspond to anything ontologically <<deep>>"[24].

There is after Chalmers, also another possibility:

"This (the above quotation, M.D.note) may be a perfectly adequate way to look at things, but there some more interesting possibilities. Most of these involve taking the role of information more seriously will consider one way of doing this in what follows. The reader is warned that the discussion falls well into the realm of speculative metaphysics, but speculative metaphysics is probably unavoidable in coming to terms with the ontology of consciousness"[25].

I consider the reflections of David Chalmers that "we may *need* some intrinsic nature in the world, to ground information states" [26], and that "Phenomenal properties have an intrinsic nature...." [27] "...over and above a *pure* information space" to be fundamental propositions, as necessary as the recognition of experience (or of the phenomenological mental states).

In the orthophysical point of view [8] one considers, that on the basis of the recognition of the mental phenomenological sense and on the basis of similar considerations as those presented in the previous paragraph, but taking also into account that there is a deep underlying reality to our universe, to be possible to construct a coherent model of existence.

This model was named the "ring of existence" [8] [28]. A concentrated scheme of this model is presented in Fig.1.

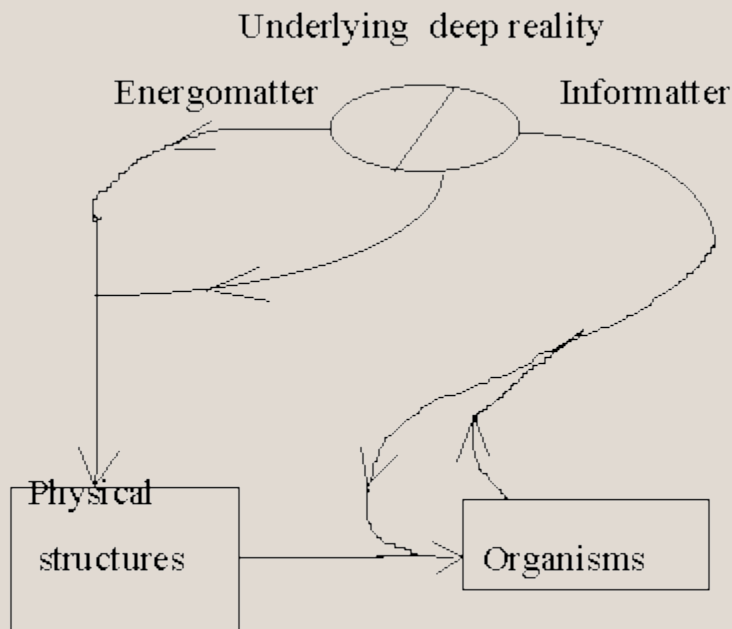


Fig. 1

In this figure one may see two deep ingredients, "informatter" and "energomatter". The underlying deep reality is considered out of space and time, the space of an universe being a physical structure. Informatter is the substratum of phenomenological senses. These are present in the deep reality (orthoexistence), in all living objects (organisms), but also in the deepest content of the elementary particles of the universe. An elementary structure (an elementary particle) emerges by a coupling between energomatter and informatter, and therefore I consider that physics of structures is not closed, but open in the underlying deep reality. The various types of elementary particles, which comprise the quanta of space, are energies modulated by phenomenological information (senses) from the deep underlying reality.

The organisms, because of some special forms of structures [8b] , may attract informatter to be coupled with these structures [29]. The coupling of informatter at this level, in comparison with the coupling at the level of energomatter, gives to the organism an informational plasticity, and a structural-phenomenological behavior.

In this supposed model of existence there are only two complementary basic ingredients, energomatter and informatter. The phenomenological manifestations of informatter give birth to the physical laws of an universe, and at the same time make possible the constitution of living organisms, of mental processes and consciousness.

The role of information (under its phenomenological form, which is the true original information) is overwhelming in such a vision, but the nature cannot be reduced only to information. Orthophysics, which introduces information in physics, is larger than structural physics; it is still a physics, but a physics with information as a fundamental ingredient and concept.

#### IV. ON THE NOTION OF CONSCIOUSNESS

Consciousness is indeed a very difficult notion. In the SP-domain, consciousness is the most evident reality for humans. Can we speak about consciousness in the S-domain? Or, in a purely P-domain?

In the psychological literature may be found the description of various *forms of consciousness*, like subconscious and preconscious forms or even unconscious consciousness. All these refer to human forms of consciousness, and therefore to the SP-realm.

An interesting case presents the zombie version of a human, a concept used by Chalmers for his logical demonstrations in consciousness theory [9]. A zombie is identical to a man, excepting that it is lacking experience. A zombie is in the S-domain and it is a semantic automaton. His behavior is identical to that of his twin human and he may even declare that he is conscious. It has a form of consciousness, but not exactly a consciousness. In any case it has a psyche, but not a mental psyche with real consciousness.

The notion of psyche is, in a way, clearer than that of consciousness. It may be applied, and it is applied for artificial intelligence and intelligent robots, therefore also in the S-domain [30]. A psyche is, in general ( hence either in the S-domain, or in the SP-domain) an informational processor ( it may be only computational, or containing also a non-computational processing) with understanding, behavior, and eventually an ego (self). A psyche may be informatic (computational, formal), or mental. A psyche

may have a consciousness, or only some form of consciousness that is not a complete consciousness (as we understand and "feel" our consciousness).

In a previous work in which I studied semantic automata [31] and presented a theory of a biological cell as an abstract organism [32], the following forms of consciousness have been defined:

- **preconscious psyche** of a semantic automaton which understands (in a formal way, by significance, as it is the case of a normal system of artificial intelligence), but does not have a programmed self to which to be related its entire activity;
- **informatic subconscious psyche** of a semantic automaton, as above, but with a programmed self which plays a role in the computing process of this object, and therefore of its behavior ( this would be also the case of a zombie);
- **phenomenologic subconscious psyche** of an organism (like a subcellular entity or a living molecule) with understanding by phenomenological senses and with a "self" which may be only an autogestalt (selfgestalt) [33];
- **structural-phenomenological subconscious psyche** (a biological cell may have such a form of consciousness if the fibers of tubulin - after Hameroff - constitute a structural informational processor and if it has a selfgestalt).

All the above forms of consciousness represent "unconscious consciousness". There is a contradiction between the terms of this expression, but it reflects the ambiguous situation of preconscious and subconscious states.

In the SP-domain, and especially in its phenomenological part we can speak also about an *infraconsciousness*. This form of consciousness is based on the phenomenological senses in informatter. In a way, the deep underlying reality is infraconscious. These may explain the idea of a conscious universe [18], or the idea that the basic reality is mind. Perhaps, nearer a possible truth is the idea of a conscious universe, having the form of an infraconsciousness, which is not quite a consciousness. But the idea of God? He, if He is at all, is a consciousness, but for an SP-theory He might be only secondary as a consciousness, because as a primary being He would only be a infraconsciousness. God might also be both primary and secondary.

The human mind may have perhaps also infraconsciousness, and possibly every living object has, inasmuch as informatter is a part of every organism. Some specific



processes in informatter may be a common infraconsciousness of a living body, or to a population of bodies.

If consciousness is a property of only well developed organisms, which are the essential features of consciousness?

Neither the semantic automata, nor the biological single cells, have consciousness, in the manner of humans. In the same situation are the multicellular organisms until they reach a specific structural complexity, as that encountered in a brain .

Perhaps an essential feature of a real consciousness is the presence, in its core, of a self-consciousness.

Consciousness is that part of a mental psyche that has a self-consciousness.

The notion of self-consciousness is a very delicate one [8a] [8d] [30]. The consciousness is a part of the mental psyche. The mental psyche comprises also the subconscious, also a preconscious part, the phenomenological senses of the infraconsciousness and may be other parts.

I considered a psyche to be a semantic informational processor with or without self [8b] [31] [30]. Then, the psyche  $\mathbf{P}$  may be written,

$$\mathbf{P} = \langle \Pi, \mathbf{U}, \Xi \rangle \quad (1)$$

where  $\Pi$  is the informational processor,  $\mathbf{U}$  is the understanding [30] and  $\Xi$  is the self (which may be lacking,  $\mathbf{P}$  remaining still a psyche).

The mental human psyche may be written,

$$\mathbf{P} = \langle \{ \Pi_1, \mathbf{M}_1, \Xi_1 \}, \{ \Pi_2, \mathbf{M}_2, \Xi_2 \}, \{ \Pi_3, \mathbf{S}_3 \}, \sigma_{\text{infra}}, \dots \rangle \quad (2)$$

where,

- $\{ \Pi_1, \mathbf{M}_1, \Xi_1 \}$  represents the consciousness,  $\Pi_1$  is the corresponding mental informational processor (using both computational processes and non-computational phenomenological processes),  $\mathbf{M}_1$  is the meaning (structural-phenomenological understanding [30]),  $\Xi_1$  is the self-consciousness;

- $\{ \Pi_2, \mathbf{M}_2, \Xi_2 \}$  represents the structural-phenomenological subconscious part of the psyche, as described at the beginning of this paragraph, and where  $\Xi_2$  is no more a self-consciousness, but a possible form of unconscious self which might be related, in a way, to the self-consciousness;
- $\{ \Pi_3, \mathbf{S}_3 \}$  represents a preconscious part that essentially may be only structural, where  $\mathbf{S}_3$  is the significance ( a structural understanding without phenomenological senses) ;
- $\sigma_{\text{infra}}$  represents the infraconscious phenomenological senses.

The subconscious and the preconscious parts of the mental psyche constitute the unconscious component of the psyche. The infraconsciousness may be also considered as a part of the unconscious psyche.

The problem of self-consciousness seems to be of fundamental importance for the consciousness.

The self-consciousness is a natural self-construction of the human brain. It is a natural emergent property of the human brain. With the neural, cellular and molecular structures of the brain and their coupling with informatter, therefore with phenomenological senses, self-consciousness is, in a way, a biological product of this structural-phenomenological organization.

In another paper I wrote:

"The philosophical experiment of aware consciousness (conscience) has three moments. The first has been described in the previous paragraph : <<beingness>> as a phenomenological sense. To this will correspond a neural structure "to be" in the brain. This is a second moment. Together, << beingness >> and "to be" constitute an awareness of this experiment, an awareness of self-existence. The third moment fulfills a *self-conscience* and is a result of an automatic comparison of <<beingness>> and "to be" ,comparison that produces a neural structure "to know". These three components constitutes the primary self-conscience,

$$\Xi_1 = \langle \textcircled{1}, \textcircled{2}, \textcircled{3} \rangle$$

where,

①-is the phenomenological sense <<beingness>>;

②- is the neural structure "to be";

③ - is the neural structure "to know".

Without the phenomenological sense, theoretically,  $\langle \textcircled{2}, \textcircled{3} \rangle$  is a structural consciousness, a non-aware consciousness. But there is more. The neural structures it was shown in the previous paragraph, may produce a secondary phenomenological sense  $\langle \langle \text{beingness} \rangle \rangle$  ( $\textcircled{1}$ ) which is more operational. And "to know" naturally will produce a phenomenological sense  $\langle \langle \text{to know} \rangle \rangle$  ( $\textcircled{4}$ ). Then, self-consceousness may have also the following organizations:

$$\Xi_1' = \langle \textcircled{1}, \textcircled{2}, \textcircled{3} \rangle$$

$$\Xi_1'' = \langle \textcircled{1}, \textcircled{2}, \textcircled{3}, \textcircled{4} \rangle$$

All these are possible modes of functioning of self-consceousness [30]."

Because  $\langle \textcircled{2}, \textcircled{3} \rangle$  is a structural self-consciousness, it may function, if it functions, as a structural self (ego), but is not a real self-consciousness. It has not awareness! Therefore, self-consceousness, a notion used for the aim of a demonstration, is aware self-consciousness, or simply said, self-consciousness [34].

The consciousness represents all the structural-phenomenological informational organizations connected around, may be in many layers, the core of self-consciousness.

All the structural knowledge of the structural theories of consciousness as those mentioned in the first paragraph of this paper may be of great help for building a consistent structural-phenomenological theory of consciousness. Also, the knowledge accumulated by psychology may prove to have a tremendous importance.

## V. Final Remarks

Consciousness can, of course, be an object of science. Although the structural science is insufficient to study consciousness, this does not mean it cannot be studied by science at all. An extended science in the phenomenological realm may prove to be the solution. For the time being, the extension of science in the phenomenological realm is very timid. The *experience* and the phenomenological sense are scientifically valid. The rest is still philosophy of science, but this philosophy may guide the search

for further steps of science. The author of the present paper is working at a project "Structural-phenomenological modeling, conceptual and symbolic". The aim of the project is to obtain a conceptual structural-phenomenological model of existence, and SP-models of various forms of reality (models of mind, models of living organisms and others). In these models the notion of information ( S , SP and P-information) plays a fundamental role. A further step will be to pass from conceptual models to symbolic models. An important objective is to write a structural-phenomenological theory of mental processes and consciousness.

## Notes and references

1. John R.Searle, *Deux biologistes et un physicien en quete de l'âme*, La Recherche, No.287, mai 1996, p.62-77.

2. David J.Chalmers, *The Puzzle of Conscious Experience*, Scientific American, December 1995, p.62-68.

3. John Horgan, *Can Science Explain Consciousness?*, Scientific American, July 1994, p.72 -78.

4. F.H.C. Crick, *The Astonishing Hypothesis: The Scientific Search for the Soul*, New York, Scribner,1994.

5. G.Edelman, *The Remembered Present: A Biological Theory of Consciousness*, New York, Basic Books, 1989.

6. R.Penrose, *Shadows of the Mind*, Oxford, Oxford University Press, 1994.

7. Daniel C. Dennett, *Consciousness Explained*, Boston, Little, Brown, 1991.

8. In the years 1977-1989 I built a philosophy of science in which a model of mental processes, mind and consciousness was strongly connected with a general ontological model of existence. This is a structural- phenomenological (named also **orthophysical**) philosophy that embraces both the structural and phenomenological aspects of reality in a unitary view:

8a. Mihai Drăgănescu, *Profunzimile lumii materiale* (in Romanian), Bucuresti, Editura Politica, 180 pag., 1979. { There is an English version : **8a'** *The depths of existence* (preprint 1992) with a web edition(1997):

<http://www.racai.ro/~ncristin/MD-Web/mdraganescu.html> }

8b. Mihai Drăgănescu, *Ortofizica* (in Romanian), Bucuresti, Editura stiintifica si enciclopedica, 456 pag., 1985.

8c. Mihai Drăgănescu, *Informatia materiei* (in Romanian), Bucuresti, Editura Academiei, 253 pag., 1990.

8d. Mihai Drăgănescu, *The Philosophical Tension and the Cosmic Feeling*, Bucuresti, Editura Academiei, 39 pag., 1991.

8e. Mihai Drăgănescu, *Eseuri* (in Romanian), Bucuresti, Editura Academiei, 302 pag., 1993

8f. Mihai Drăgănescu, [L'Universalité ontologique de l'information](http://www.racai.ro/books/draganescu), Bucuresti, Editura Academiei, 1996; (also on the INTERNET, <http://www.racai.ro/books/draganescu>)

9. David J. Chalmers, *The Conscious Mind*, New York, Oxford, Oxford University Press, 1996.

10. The denomination of mysterians was given by Owen Flanagan (apud David Chalmers).

11. Mihai Drăgănescu, *Cognition, Models of Mind, Models of Existence*, Conference, Krasnow Institute/George Mason University, Fairfax, Virginia, USA, Monday, April 3, 1995.

12. Mihai Drăgănescu, [Sur la notion et le domaine de la Vie Artificielle](#) (On the notion and the domain of artificial life), Bulletin de la Classe des Sciences, Academie Royale de Belgique, 6e serie , Tome VI, No.7-12, 1995, 13 pages.

13. Mihai Drăgănescu, *Mind and Informatter*, Noesis, vol.XIII, 1987, p.77-80. See also: [8c], p.83-85; [8f], Ch.3, § 3.1.

14. David J.Chalmers, *The Puzzle of Conscious Experience*, op.cit., p.64. See also [9], p.107.

15. David J. Chalmers, *The Conscious Mind*, op.cit., p.93.

16. Idem, p.118.

17. Mihai Drăgănescu, Impasul structural al stiintei ( in Romanian)- *The Structural Impasse of the Science-*, exposition at the Babes-Bolyai University, Cluj-Napoca, Romania, 18 noiembrie 1996.

18. Menas Kafatos,Robert Nadeau, *The Conscious Universe-Part and Whole in Modern Physical Theory*, Springer-Verlag, New York, 1990.

19. Mihai Drăgănescu, [Deep Reality, Conscious Universe and Complementarity](#), E-preprint, November 6, 1996. (To be published by The Noetic Journal.)

20. Mihai Drăgănescu, *The method of structural-phenomenological recognition*, under preparation, January 1997.

21. Idem.

22. David J. Chalmers, *The Conscious Mind*, op.cit., p.301.

23. Idem, p.284.

24. Idem, p.302.

25. Ibidem.

26. Idem, p.304.

27. Ibidem.

28. See also Mihai Drăgănescu, *Inelul lumii materiale* ( The Ring of Existence), Bucuresti, Editura stiintifica si enciclopedica, 456 pag., 1989 ( a second common edition of the volumes [8a] and [8b]).

29. This was named "the coupling problem" in Mihai Drăgănescu, [Continuities and Discontinuities in the Realms of Life and Mind](#), E-preprint, September 30,1996. (To be published by Revue Roumaine de Philosophie). See also [8b].

30. Mihai Drăgănescu, [Notes on the notions of understanding and intelligence](#), E-preprint, January 2, 1997. By E-mail: [dragam@valhalla.racai.ro](mailto:dragam@valhalla.racai.ro) (and by the web, <http://www.racai.ro/~ncristin/MD-Web/mdraganescu.html> ).

31. Mihai Drăgănescu a.o., *Electronica Functionala* (in Romanian ), Bucuresti, Editura Tehnica, 1991, p.327-333.

32. Idem, p.393-407.

33. If a virus is alive it may have a phenomenological subconsciousness; if not, it cannot have any form of consciousness, because he has not the structural organization with enough complexity to process structural information with significance.

34. It would be possible to maintain the name of self-consciousness for  $\bar{\Xi}_1$ , which is indeed primary and perhaps a rare phenomenon. For all the others  $\bar{\Xi}'_1, \bar{\Xi}''_1$  ... the denomination of self-consciousness remains adequate.

Bucharest, January 11,1997.